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NEW DISTRIBUTION RECORDS FOR *OPHIOGOMPHUS HOWEI*  
(ODONATA:GOMPHIDAE)K. J. Tennessen<sup>1</sup>

## ABSTRACT

New distribution records establish *Ophiogomphus howei* as a resident species in Wisconsin. Kentucky, Maine, and Minnesota are added as new state records for this seldom-encountered gomphid dragonfly. Larval habitats appear to be undisturbed rivers 10–200 m wide, with sand and gravel substrates.

Prior to its discovery in the New River in Virginia and North Carolina (Kennedy and White 1979), *Ophiogomphus howei* Bromley was known from only three adult specimens [holotype female (Bromley 1924), male (Calvert 1924), and a female coll. by T. W. Donnelly in 1967 (unpubl., subsequently reported by Kennedy and White 1979)]. The species has been considered rare and restricted in range to the Appalachian Mountains based on small, scattered collections from eight localities: MASSACHUSETTS: Hampshire Co., Connecticut River near Amherst (Bromley 1924, type locality); NORTH CAROLINA: Alleghany Co., New River (Kennedy and White 1979); NEW YORK: Broome Co., Binghamton, 6 May, late nineteenth or early twentieth century, N. Banks (specimen in Museum of Comparative Zoology, Harvard—T. W. Donnelly, pers. comm.); PENNSYLVANIA: Susquehanna Co., Susquehanna River near Great Bend, Halstead (Kennedy and White 1979); Cumberland Co., Susquehanna River near Lemoyne (Calvert 1924); TENNESSEE: Monroe Co., Tellico River (Louton 1982); VIRGINIA: Carroll and Grayson Co., New River (Kennedy and White 1979).

Adult *O. howei* are easily distinguished from all other species of the genus by (1) small size—total length 31–37 mm, hind wing 18–22.5 mm long, and (2) hind wings tinged yellow or orange in basal two-thirds (see Carle 1992 for a key to the North American species of *Ophiogomphus*.)

The population in the New River in southwestern VA and northwestern NC was the first and only relatively large population known inhabiting a long stretch (39 km) of stable, little-disturbed riffle habitat. The locality on the Tellico River was based on one reared male (east TN, County Road 2510), and represents the southernmost known record. This site was inundated when Tellico Reservoir was created in 1979, undoubtedly extirpating the species there.

The above records indicated that *O. howei* was easterly distributed, occurring only in large, undammed and relatively undisturbed rivers in the Appalachian Mountain range. However, a recent collection in Wisconsin (Tennessen

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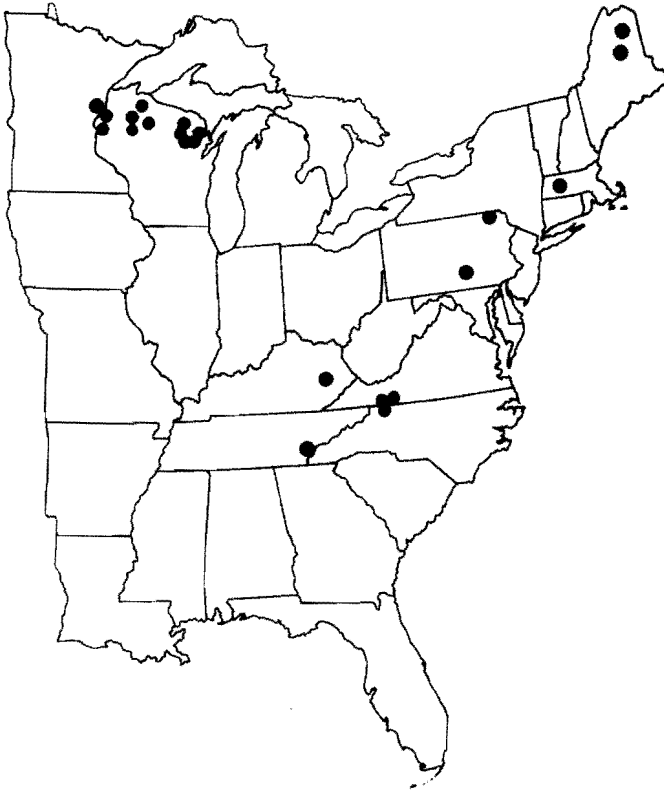


Figure 1. Eastern United States, showing updated distribution of *Ophiogomphus howei*.

1988) extended its known range approximately 1300 km (800 miles) in a west-northwesterly direction (Fig. 1).

A more intensive search for *O. howei* by several colleagues has resulted in the collection of this species in 24 townships in six watersheds across northern Wisconsin, comprising 11 county records (see Table 1 and Fig. 2). All records lie north of the "tension zone" shown by Ries (1967). The majority of collections consist of exuviae only, but reliable identification is possible because of several unique larval features, such as small size (length of final instar 22.5 mm or less) and lack of dorsal hooks (Kennedy and White 1979), along with collections of adults at some localities. Exuviae are also definite evidence that a species breeds in the body of water near which they are found. The largest populations appear to be at the St. Croix and the South Fork Flambeau Rivers. The earliest date exuviae were found was 29 May, significantly later than commencement of emergence in the New River in 1977, which began 30 April, but close to the earliest 1978 emergence, which began 21 May (Kennedy and

Table 1. Collection records of *Ophiogomphus howei* in Wisconsin.

County	Watershed	Locality	Dates	Stages	Collectors
Ashland	Flambeau R. N. Fork	Stubbs Rapids	6/11/89	1 exuv.	W. A. Smith.
Burnett	St. Croix R.	1. Co. O Landing	6/17/89-	156 exuv.	W. A. Smith &
"	"	2. Hwy. 35 br.	7/16/89;		T. E. Vogt.
"	"	3. Hwy. 70 br.	and	80 exuv.	
"	"	4. Hwy. 77 br.	5/29/90-		
"	"	5. Grantsburg	6/24/90	2 adults	
Forest	Peshtigo R.	Big Joe Canoe Landing	6/23/89	3 exuv.	W. A. Smith, et. al.
Langlade	Wolf R.	Oxbow Rapids State Park	6/23/89	8 exuv.	W. A. Smith, et. al.
Marinette	Peshtigo R.	Peshtigo R. Campground, Hwy. 141	6/25/89	1 exuv.	W. A. Smith, et. al.
Menominee	Wolf R.	1. Big Smokey Falls, Co. M	9/39/88	1 nymph	D. J. Heath.
"	"	2. Minnow Cr.	9/29/88	1 nymph	D. J. Heath.
Oconto	Oconto R.	Bagley Rapids Campground	6/22/89	15 exuv.	W. A. Smith.
Polk	St. Croix R.	Interstate Pk.	6/18/89	11 exuv.	W. A. Smith.
Price	Flambeau R. South Fork	1. Down River Rd.	7/13/87	20 nymphs	K. J. Tennessee.
"	"	"	6/21-	19 exuv. +	
"	"	"	6/23/89	5 adults	K. J. Tennessee.
"	"	2. Co. W. bridge	6/21-	10 adults +	W. A. Smith, et. al.
"	"	"	6/23/89	83 exuv.	
"	Elk R.	3. Co. F bridge	10/16/90	45 nymphs	D. J. Heath.
"	"	Co. S bridge	6/20-	2 adults	K. J. Tennessee.
"	"	"	6/22/88		
Rusk	Flambeau R.	S. of Ladysmith	6/6/91	4 exuv.	G. Miller
Sawyer	Flambeau R. South Fork	Co. M bridge	6/24/88	3 exuv.	K. J. Tennessee.
"	Chippewa R.	Town Line Rd. bridge	6/17/89	14 exuv.	W. A. Smith.

White 1979). The latest date adults were captured in Wisconsin was 23 June, which extends the known flight season by three weeks.

The rivers in which *O. howei* has been found in Wisconsin are medium to large (width 10 m to 200 m) with predominately gravel and sand substrates, but large rocks and boulders are often present. Elevations range from 200 m to 470 m above sea level. Disturbance in the segments where *O. howei* occurs appear minimal, although forestry and agricultural practices have had some impact on most of the watersheds. This species has not been found in rivers where clear-cutting of timber or farming have opened large stretches of river bank, although impacts have not been studied.

Three additional new state records (Fig. 1) are herein reported: KENTUCKY: Breathitt Co., Middle Fork River, Rd. 315, 29 June 1986, C. Cook, 7 males. MAINE: Penobscot Co., East Branch Penobscot River, Grindstone Falls, 1988, exuviae, F. L. Carle; Aroostook Co., Aroostook River near Ashland, 1988, exuviae, F. L. Carle. MINNESOTA: Pine County, St. Croix River, 13 June 1990, T. E. Vogt, 1 exuviae. Also, the TN record is confirmed as I collected two nymphs of *O. howei* in the Tellico River upstream of the

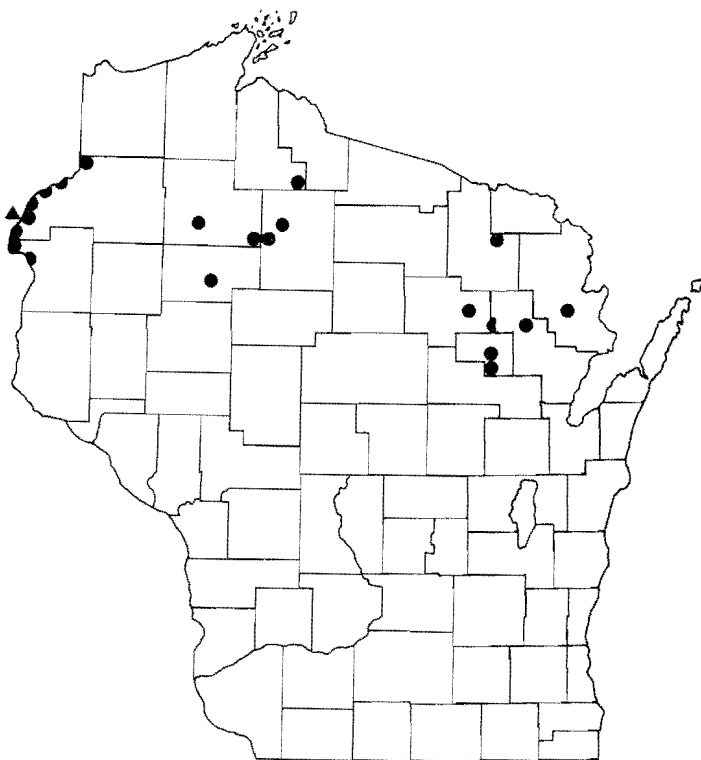


Figure 2. Known distribution of *Ophiogomphus howei* in Wisconsin and Minnesota.

reservoir, Monroe County, river mile 21.8 (Nars Ford, elev. 253 m), 7 Oct. 1992. The river at this site is about 80 feet wide and free-flowing; the fairly stable substrate is a mixture of cobble, gravel and sand. The dominant aquatic plants are *Potamogeton epihydrus* and *Podostemum ceratophyllum*.

The distribution shown in Fig. 1 indicates that there are three population "centers", one northeastern, one southern Appalachian, and one north-midwestern. However, this species is difficult to find, and further intensive collecting is needed to determine if annectent populations exist.

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